

PALOMAR ENERGY PROJECT (01-AFC-24) CEC STAFF DATA REQUEST NUMBER 10	
Technical Area: Air Quality	Response Date: April 8, 2002

REQUEST:

Please provide further explanation of the method used to estimate construction-plus-background annual NO₂ impacts and a discussion that explains how the proposed method includes the annual NO₂ background. If the proposed method does not include the background, then the applicant should revise the modeling analysis using a method for annual NO₂ that conforms with U.S. EPA guidelines.

RESPONSE:

Annual NO₂ concentrations were estimated using the ozone limiting method (OLM) to produce representative estimates of the annual NO₂ concentrations during construction. The annual NO₂ concentration due to construction was estimated using the OLM to maintain consistency with the predicted maximum 1-hour NO₂ concentrations. In this method, the hourly concentration of NO₂ is produced as the sum of:

- Directly emitted NO₂,
- NO₂ converted from NO on a molar basis less than or equal to the ozone concentration for the given hour, and
- The corresponding background NO₂ concentration for the same hour.

In the OLM as implemented for the Palomar project, the annual average concentration of NO₂ was computed as the sum of the hourly NO₂ concentrations produced, using the OLM divided by the number of hours of data. In essence, the NO₂ annual background concentration is implicitly contained in the resultant annual NO₂ concentration, since the annual concentration includes the sum of the hourly NO₂ concentrations divided by the number of hours in the year. To avoid double counting of the background NO₂, the background annual NO₂ concentration is not added to the OLM-computed annual average concentration. The resultant annual estimate of the NO₂ concentration is thus internally consistent with the hourly NO₂ concentrations used to compute the value, and implicitly includes the annual background NO₂ concentration.

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It would be inconsistent to model the maximum 1-hour NO₂ concentrations using the OLM, but estimate the annual average concentration by assuming a set fraction of NO to NO₂ conversion (i.e., 75%) as suggested in the Guideline on Air Quality Models (GAQM - Appendix W to 40 CFR Part 51).

The 75% conversion fraction referenced by CEC Staff is not an appropriate fraction for use in simulating annual impacts due to construction emissions and is overly conservative. The GAQM guidance is implicitly based assuming continuous operation of the sources with emissions subject to the full range of meteorological conditions that occur during the day and night at a “typical” location. In contrast, the emissions from construction are non-continuous and occur only during the daylight hours. Emissions during the morning will not experience elevated ozone concentrations, thereby limiting the amount of conversion to less than would occur later in the day if emissions continued into the late afternoon and evening. In addition, due to the low-level nature of the emissions during construction, the maximum annual impact occurs at the property line of the facility. Thus, there is essentially no transport time to the point of maximum impact, and hence, there is too little time to allow any significant transformation of NO to NO₂ at the point of annual maximum impact other than by reaction of NO with ozone.